TECHNOLOGY NEEDS/OPPORTUNITIES STSTEMENT
METAL DECONTAMINATION AND RECYCLING FOR THE D&D PROGRAM

Identification No.: RL-DD021
Date: August 2001
Program: Decontamination and Decommissioning
OPS Office/Site: Richland Operations Office/Hanford Site
PBS No.: RL-RC01
Waste Stream: Metal LLW debris (ER-05, risk = 4)
TSD Title: N/A
Waste Management Unit (if applicable): N/A
Facility: Hanford facilities undergoing final decontamination and decommissioning

Priority Ranking: This entry addresses the Accelerated Cleanup: Paths to Closure (ACPC) Priority:

____ 1. Critical to the success of the ACPC
_X_ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high lifecycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays)
____ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

Need Title: Metal decontamination and recycling for the D&D program.

Need/Opportunity Category: *Technology opportunity* - the project desires an alternative to the current or planned baseline technology/process (i.e., a baseline exists but can be improved).

Need Description: Metal decontamination and recycling is needed to cost-effectively reduce radioactive waste volumes and allow for recycle/reuse of metals and equipment.

Schedule Requirements:
Earliest Date Required: 10/1/2001
Latest Date Required: 9/30/2046

Problem Description: The estimated total volume of metallic waste exceeds 150,000 m^3. Current plans are to dispose of this waste at the ERDF. Disposal of contaminated materials and equipment results in loss of assets as well as the resources expended to dispose of the assets. An effective means of decontamination and verification of results is needed to avoid such losses.

Benefit to the Project Baseline of Filling Need: Reduced waste volumes will be placed in the ground, resulting in reduced long-term liability. Potential cost savings include: (1) disposal costs are avoided, and (2) the cost of obtaining an asset is reduced (e.g., the cost to make a drum from recycled material is less costly than to buy a new drum).

Functional Performance Requirements: Methods are needed that can cost-effectively decontaminate materials so that they can be released to uncontrolled areas for recycle or reuse. The requirements for the technology include:

- Decontaminate pipes and internal components to allow for release to uncontrolled areas
- Verify that the free release criteria have been met. This includes methods for inspecting equipment and piping internals and other difficult geometries
- Be cost competitive with the alternative of sending the materials to the Environmental Restoration Disposal Facility (ERDF)
- Minimize secondary waste generation and avoid any hazardous/mixed waste generation
- Easily deployed
- As a minimum, any technology should be applicable to the reuse/recycle of steel and carbon steel.

WBS No.	***TIP No***.
1.4.03.1	N/A

Relevant PBS Milestone: PBS-MC-031

Justification for Need:

Technical: Current methods are not cost-effective for reducing radioactive waste volumes.

Regulatory: Regulations for release to uncontrolled areas.

Environmental Safety & Health: Long-term liability (potential for a release) could be reduced with recycling and reuse of materials.

Cost Savings Potential (Mortgage Reduction): Rough order of magnitude (ROM) life cycle cost (LCC) savings of $10M for the DOE Complex including $2M for the Hanford Site. LCC savings estimate is based on the assumption that metal decontamination could result in double the savings realized by lead decontamination. Potential areas of cost savings include: (1) the cost of disposal is avoided, and (2) the cost of obtaining an asset is reduced (e.g., the cost to make a drum from recycled material is less costly than to buy a new drum).

Cultural/Stakeholder Concerns: Reducing waste volumes that will be placed in the ground will result in reduced long-term liability.

Other: None identified.

Current Baseline Technology: Piping and equipment suspected of internal contamination are usually disposed of on site as radioactive waste at extremely low cost (FY 1997 costs of $\$78/m^3$ for disposal, handling and transportation). When suspect materials are to be decontaminated, chemical treatment or surface cleaning with high-pressure water jets is applied prior to the release of these materials.

End-User: Environmental Restoration Project

Site Technical Points of Contact:
Kim Koegler, BHI, (509) 372-9294, (509) 372-9654, kjkoegle@bhi-erc.com
Mark Morton, BHI, (509) 373-1628, 373-5418, mrmorton@bhi-erc.com
Sue Garrett, PNNL, (509) 375-2398, (509) 375-6417, sue.garrett@pnl.gov

Contractor Facility/Project Manager:
Mike Mihalic, BHI, (509) 373-1382, (509) 373-5418, mamihali@bhi-erc.com

DOE End User/Representative Points of Contact:
D. Chris Smith, (509) 372-1544, (509) 372-1926, Douglas_C_Chris_Smith@rl.gov
John Sands, (509) 372-2282, (509) 373-0726, John_P_Sands@rl.gov